

REMARKS

The Specification is amended on page 6, lines 20 to 27, in order to replace "Patent Application EP 0,702,032 A2" with ---U.S. Patent No. 5,883,145--, since these two applications are equivalent.

Claims 1-9, 11-12, 14, and 18-19 were canceled without prejudice.

Claims 10, 13, 15-17 are pending. Claim 17 has been withdrawn from consideration. Accordingly, Claims 10, 13, and 15-16 are under consideration.

Claim 1 is currently amended, in order to improve readability. Support for the amendment is found in the Specification as originally filed. No new matter is added upon entry of the amendment. Upon entry of the amendment, Claims 10, 13, and 15-16 will be active.

Applicants thank the Examiner for conducting the kind and courteous discussion with Applicants' representative, Daniel R. Evans, on January 6, 2005.

The present invention is directed to a process for preparing a sheet of a crosslinked polyolefin foam expanded unidirectionally only in its thickness, comprising surface-crosslinking both faces of an unsupported intermediate polyolefin sheet to be expanded so that its degree of surface crosslinking is different from its core, these faces being perpendicular to the direction of expansion, and expanding and crosslinking the so formed sheet only in its thickness.

The process of unidirectionally expanding a surface crosslinked polyolefin sheet provides a solution to a problem that is encountered in continuous production operations. In these conventional processes, when expansion occurs in the same direction in which the sheet is driven; the driving speed of the material must be different at the upstream and downstream ends (page 3, lines 22-34). This complicates the overall production process, and may give rise to defects in the resultant foamed material.

The rejection of Claims 10 and 15 under 35 U.S.C. § 103(a) over JP 04-213341 (JP '341, as evidenced by the English translation thereof (PTO 03-2661) in view of either U.S. Patent No. 3,608,006 (US '006) or JP 09-150431 (JP '431) and alleged admitted prior art (page 5, lines 21-25 and page 6, lines 1-11 of August 24, 2004 response) is respectfully traversed.

JP '341 describes expansion of a polyolefin sheet that occurs both in the thickness and the width of the film. Thus, JP '341 does not describe unidirectional expansion.

The Office has taken the position that JP '341 is not limited to any particular degree of surface crosslinking (page 3, Office Action dated November 17, 2004). However, this is not the case. JP '341 states that "the degree of crosslinking" is "usually 10-40% in terms of gel fraction" (page 5, [0011]), and that it is undesirable to surface crosslink a material when the degree of crosslinking is 45% in terms of gel fraction (page 2, [0003]). JP '341 states that with an "increasing degree of crosslinking, excessive viscoelasticity of the resin may prevent sufficient expansion, cause surface cracks, [and] cause the degree of [core] crosslinking to be reduced" (page 2, [0003]).

The Examiner's attention is directed to the data contained in Table 2 (page 12), in which the maximum degree of surface crosslinking is 43%, which is substantially the same as the degree of core crosslinking (44%). The Examiner's attention is further directed to paragraphs [0030] and [0031], in which the extruded product has a thickness of 3 mm and a width of 450 mm prior to expansion; but subsequent to expansion the thickness of the sheet is 7 mm and the width is 800 mm. Thus, JP '341 describes a process in which there is a 133% increase in the thickness and a 78% increase in the width upon expansion, which corresponds to a 30-fold foaming expansion (page 10; [0031]).

Therefore, JP '341 is limited to a degree of surface crosslinking which does not provide for unidirectional expansion.

If unidirectional expansion is not possible with a degree of surface crosslinking that is 43%, in terms of gel fraction, and if a degree of surface crosslinking any greater than this amount is undesirable; it should be clear that JP '341 suggests that unidirectional expansion in a manner as presently claimed is just not possible.

The Office cites US '006 and JP '431 as examples of "the well known technique of obtaining a unidirectionally expanded foam sheet by providing a non-extensible support layer (page 4, November 17, 2004 Office Action), and has taken the position that a surface crosslinked layer is somehow equivalent to a piece of paper. It is hard to imagine how this parallel can be drawn, when one considers that both US '006 and JP '431 describe the preparation of composite foamed sheets in which a non-extensible support layer is adhered (US '006, col. 1, lines 63ff.) or laminated (JP '431, Abstract) to the polyolefin sheet prior to crosslinking and expansion. US '006 describes that a polyolefin composition is melted in order to effect adherence between the polyolefin composition and the lining.

Furthermore, there is no suggestion contained in either US '006 or JP '431, or for that matter JP '341, that would suggest that a non-extensible support layer would include a surface crosslinked polyolefin sheet. None at all. If anything JP '341 states that unidirectional expansion is not possible. In view of these things, it should be clear that there can be issue of obviousness over JP '341 in view of either US '006 or JP '431 in further view of the alledged admissions made by Applicants.

It is kindly requested that the Examiner withdraw this rejection.

The rejection of Claim 13 under 35 U.S.C. § 103(a) over JP '341 in view of either US '006 or JP '431, and further in view of U.S. Patent No. 5,087,395 (US '395) is respectfully traversed.

As noted above, the claimed invention is believed to be unobvious over JP '341 in view of either US '006 or JP '431, as the combined references do not suggest a method for

expanding a surface crosslinked polyolefin sheet in a unidirectional manner. Furthermore, US '395 does not describe unidirectional expansion. Thus, the combined references do not suggest expanding in a unidirectional manner, as presently claimed. In fact, the foaming method described in US '395 results in a 30-fold expansion (col. 5, *ll. 55-60*), as described in JP '341.

Since the combined references do not suggest a method as presently claimed, it is believed that there can be no issue of obviousness.

Therefore, it is requested that the Examiner withdraw this rejection.

The rejection of Claim 16 under 35 U.S.C. § 103(a) over JP '341 in view of either US '006 or JP '431, and further in view of U.S. Patent No. 5,883,145 (US '145) is respectfully traversed.

As noted above, the claimed invention is believed to be unobvious over JP '341 in view of either US '006 or JP '431, as the combined references do not suggest a method for expanding a surface crosslinked polyolefin sheet in a unidirectional manner. US '145 is cited showing that it is known to crosslink very low density polyethylene, but there is little else that this reference contributes to the overall analysis.

Consequently, it is kindly requested that the Examiner withdraw this rejection.

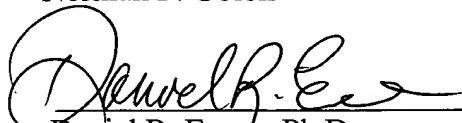
Application No. 09/580,874
Reply to Office Action of November 17, 2004

In view of the above, it is believed that the claims are in a condition for allowance. Should the Examiner deem that a personal or telephonic interview would be helpful in advancing this application toward allowance, he or she is encouraged to contact Applicant's undersigned representative at the below-listed telephone number.

Respectfully submitted,

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